REMARKS/ARGUMENTS

Claims 4 and 6-11 are pending in the Application. Claim 5 has been cancelled, because the limitations of Claim 5 have been incorporated into Claim 4. Claims 10-11 are new.

Claim 4 is currently amended to incorporate the mass ratio of component (A) to component (B) ranges from 0.001/100 to 0.5/100 by conversion to solids concentration formerly required by dependent Claim 5 therein. Support therefore is found in the Specification at page 4, lines 3-7, and page 15, lines 28-36. Claim 9 is currently amended to incorporate the mass ratio of component (A) to component (B) ranges from 0.01/100 to 0.3/100 by conversion to solids concentration formerly required by dependent Claim 5 therein. Support therefore is found in the Specification at page 15, lines 28-36.

Claims 4 and 9 are also currently amended to expressly state that "the cationic polymer fixes the titanium dioxide and/or calcium carbonate filler particles to the fibers of the pulp and thereby enhances the ash content and opacity of the filler-containing paper produced relative to the ash content and opacity of the filler-containing paper produced without including the cationic polymer in the pulp slurry. Support for the functionally limiting wherein clause is supported in the Specification at page 1, line 31, to page 2, line 5; page 2, line 35, to page 3, line 2; page 4, lines 9-17; page 14, lines 8-24; page 15, lines 10-18 and 28-36; page 20, Table 1 and lines 7-14; page 23, Table 2 and lines 5-10; and page 25, Table 3 and lines 5-10.

Claims 4 and 9 are also currently amended to limit the pulp slurry to a pulp slurry consisting essentially of pulp fibre, a cationic polymer containing vinylamine units and a particulate filler (B) of titanium dioxide and/or calcium carbonate on a substrate. Support for the transitional phrase "consisting essentially of" is found in the Specification at page 14, lines 16-24, which teaches that other components may be "added where required so that there

may be manifested the properties required in accordance with the paper type, or so that the operational characteristics are enhanced." The transitional phrase "consisting essentially of" is a phrase which limits the scope of the composition, in this case the pulp slurry, to the specified materials "and those that do not materially affect the basic and novel characteristics" of the composition. *In re Herz*, 537 F.2d 549, 551-52 (CCPA 1976). In other words, the transitional phrase, "consisting essentially of," covers products which include the listed elements, as well as unlisted elements, so long as the unlisted elements "do not 'materially affect the basic and novel properties of the invention.'" *AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1239 (Fed. Cir. 2003)(citation omitted).

Claims 4 and 9 have also been amended to require "fixing the cationic polymer and filler particles to the fibers of the pulp." Support therefore is found in the Specification at page 2, line 36, and page 4, line 11.

New dependent Claims 10 and 11 limit the particulate filler (B) in currently amended Claims 4 and 9 to titanium dioxide.

No new matter is added.

Applicant appreciates the Examiner's statement that the amendments and arguments filed April 27, 2010 have overcome all previous rejections over applied prior art. Thank you. However, the Examiner entered new grounds of rejection. Office Action dated May 25, 2010 (OA), page 2, second paragraph. In light of the current amendments to Claims 4 and 9, the new grounds of rejection should be withdrawn.

Rejections of Claims 4-9 under 35 U.S.C. § 102/103 over Kuo, as evidenced by Varveri

Previously presented Claims 4-9 are rejected under 35 U.S.C. § 102 as anticipated by Kuo (U.S. Patent 6,273,998, issued August 14, 2001), as evidenced by Varveri (U.S. Patent 3,639,208, issued February 1, 1972)(OA, p. 3). Previously presented Claims 4-9 are

alternatively rejected under 35 U.S.C. § 103 as obvious in view of Kuo and Varveri (OA, p. 3). In light of the current amendments to Claims 1 and 9, the rejections should be withdrawn.

The Examiner states (OA, pp. 3-5) that Kuo describes and/or teaches the steps, components, and overlapping component proportions of a method for producing filler-containing paper comprising:

depositing a pulp slurry comprising a cationic polymer containing vinylamine units and a titanium dioxide and/or calcium carbonate filler on a substrate (Kuo, col. 1, ll. 13-22; col. 12, ll. 30-35; col. 14, ll. 61-67); and

dewatering the applied pulp (Kuo, col. 1, ll. 46-59);

wherein the cationic polymer component comprises from 0.005 to 0.5%, preferably 0.01 to 0.3%, most preferably 0.02 to 0.1%, of the dry weight of the pulp (Kuo, col. 10, l. 66, to col. 11, l. 11); and

wherein the polymer includes polymerized N-vinylfomamide units with at least 20 % of the formyl groups hydrolyzed (Kuo, col. 8, l. 13, to col. 9, l. 11).

The Examiner well understands that the inventive drainage/retention aid Kuo adds to its pulp slurry is a combination of a cationic vinylamine copolymer and charged microparticles (Kuo, Claims 1-11)(OA, p. 3, last ¶). However, the Examiner concluded that "the open language of the claims allows using the microparticle[s] in addition to the cationic vinylamine copolymer" (OA, p. 3, last ¶) and found that "[t]he ratio of the disclosed typical amount of added copolymer [of 0.005-0.5% (Kuo, col. 10, l. 66, to col. 11, l. 10)] to filler overlays the claimed range [of 30% calcium carbonate filler in bleached kraft (Kuo, col. 14, ll. 61-67)]" (OA, p. 4 last ¶; p.5, 1st ¶). Based on the above findings and conclusions, the Examiner found that Kuo either anticipates Applicant's previously presented claims and/or would have rendered Applicant's previously presented claims obvious to a person having ordinary skill in the art.

Applicant's currently amended claims are neither anticipated by, nor obvious in view of, Kuo's disclosure for the following reasons.

First, the use of the transitional phrase "depositing a pulp slurry consisting essentially of pulp fibre, a cationic polymer . . . and a particulate filler (B) of titanium dioxide and/or calcium carbonate on a substrate" in currently amended Claims 4 and 9 closes Applicant's claimed pulp slurry to the charged microparticles Kuo requires for enhanced drainage/retention (Kuo, Claims 1 and 11). Kuo requires typical dosage amounts for its inorganic microparticles in the range from 0.005 to 3%, preferably from 0.1 to 1.5%, most preferably from 0.2 to 1% by weight based on the weight of the dry pulp (Kuo, col. 11, ll. 9-14). Kuo requires typical dosage amounts for its organic microparticles in the range preferably from 0.01 to 1%, most preferably from 0.02 to 0.5% by weight based on the weight of the dry pulp (Kuo, col. 11, ll. 9-14). Kuo's microparticles are said to be essential for improved drainage/retention (Kuo, col. 5, ll. 51-62; Claims 1-11).

Kuo states (Kuo, col. 5, l. 63, to col. 6, l. 5; emphasis added):

> Suitable microparticles for use in this invention generally include organic polymeric particles and/or inorganic colloidal particles having positively or negatively charged surfaces. As used herein, the terminology "charged surface" refers to a cationic, anionic or amphoteric surface charge. The charge density of this surface charge is not, per se, critical to the invention, provided of course that the microparticles interact with either the cationic polymers of the invention or the anionic components which are present in the aqueous pulp suspension

Kuo adds (Kuo, col. 6, ll. 23-25), "Suitable inorganic particles for use in this invention are generally inorganic colloidal materials having positively or negatively charged surfaces . . . ." On the other hand, Kuo teaches (Kuo, col. 6, ll. 9-12), "Suitable organic polymeric microparticles for use in the invention include organic polymeric microparticles which are either water dispersible or colloidally water soluble, and have a charged surface." Kuo expressly states with respect to the inorganic microparticles employed in Example 4 (Kuo, col. 12, ll. 42-45):

> The combination of vinylamine copolymers and microparticles exhibited a surprising synergistic effect which was more effective than other systems tested.

Kuo adds for the organic microparticles of Examples 8 (Kuo, col. 14, ll. 17-21) and 11 (Kuo, col. 14, ll. 61-65; emphasis added):

> This example [Example 8] demonstrates the unexpected synergism between a hydrolyzed copolymer of NVF and acrylonitrile (polymer A) and an organic microparticle (Polyflex CP is a polymeric particulate commercially available from cytec) as a drainage aid.
>
> . . . . .
>
> This example [Example 11] demonstrates the unexpected synergism between vinylamine (VAm)-containing copolymers (polymer A and I) and an organic microparticle (Polyflex CP) on filler retention. Polymer I is a copolymer containing NVF, VAm and repeating units of amidine (structure iii).

From Kuo's teaching as a whole, it should be immediately apparent to the Examiner that Kuo's microparticles would materially affect the basic and novel characteristics and properties of Applicant's claimed method and are therefore excluded from a pulp slurry consisting essentially of pulp fibre, a cationic polymer containing vinylamine units and a particulate filler (B) of titanium dioxide and/or calcium carbonate utilized in Applicant's claimed method. Therefore, persons having ordinary skill in the art reasonably would have understood that Applicant's claimed method is not anticipated and/or obvious in view of Kuo's process of producing filler-containing paper comprising depositing a pulp slurry containing pulp fibre, a cationic polymer containing vinylamine units, charged microparticles, and either calcium carbonate or titanium dioxide; and dewatering.

Moreover, persons having ordinary skill in the art would have understood that the dosage amounts of polymer and microparticles added to Kuo's pulp slurry are dosage amounts of polymer and microparticles which form a synergistically effective combination "which was more effective than all other systems tested". The listed amounts for the cationic polymer and charged microparticles, which combined produce the synergistically

more effective drainage or filler retention, reasonably would not be expected to produce the same or similar drainage/retention effect in separate dosage amounts. In other words, persons having ordinary skill in the art reasonably would have expected that substantially greater dosage amounts of Kuo's cationic polymer itself than the 0.005 to 0.5%, preferably 0.01 to 0.3%, most preferably 0.02 to 0.1%, of the dry weight of the pulp, (Kuo, col. 10, l. 66, to col. 11, l. 11) would be required to achieve the same or similar drainage/retention effect as Kuo's synergistically effective combination of cationic polymer and microparticle amounts.

The Examiner should note that Kuo compared a combination of 0.05% polymer and 0.3% inorganic microparticle to 0.05% polymer itself in the drainage test of Example 4 (Kuo, col. 12, l. 30, col. 13, l. 11). The Examiner also should note that Kuo compared a combination of 0.06% polymer and 0.3% inorganic microparticle to 0.06% polymer itself in the filler retention test of Example 7 (Kuo, col. 13, l. 62, col. 14, l. 14). The Examiner should also note that the percentage of cationic polymer per dry weight of pulp in the filler retention test of Kuo's Example 11 (Kuo, col. 14, l. 60, to col. 15, l. 11) is not indicated. While 0.03% polymer with and without microparticles was employed in the drainage tests of Examples 8-10 (Kuo, col. 14, ll. 15-57), there is no indication that 0.03% polymer without the addition of microparticles improved filler retention or enhanced the ash content or opacity of the filler-containing paper as Applicant's claimed methods currently require.

While persons having ordinary skill in the art reasonably would have understood from Kuo's Example 7, Table 4, that 0.06% polymer provided a significant improvement in filler retention over No Polymer (Kuo, col. 13, l. 62, to col. 14, l. 13), (1) Lai strongly suggests that addition levels of hydrolyzed N-vinylamide polymers lower than 0.05% by weight based on the dry weight of the pulp have no apparent effect on filler retention (Lai, EP0331047, published September 6, 1989, p. 5, ll. 54-56; p. 8, Example 12; p. 9, Claims 1-15), and (2)

Applicant's claimed processes require no more than 0.04% of the component (A) cationic polymer (Applicant's Claims 4 and 9).

Furthermore, the Examiner also will note that Applicant's claims require "dewatering the applied pulp thereby fixing the cationic polymer and filler particles to the fibers of the pulp . . . whereby the cationic polymer fixes the titanium dioxide and/or calcium carbonate filler particles to the fibers of the pulp and thereby enhances the ash content and opacity of the filler-containing paper produced relative to the ash content and opacity of the filler-containing paper produced without including the cationic polymer in the pulp slurry" (Claims 4 and 9). Both the ash content and the opacity of the of the filler-containing paper produced by the claimed process must be enhanced relative to the ash content and opacity of the filler-containing paper produced without including the cationic polymer in the pulp slurry. If the ash content and the capacity of the of the filler-containing paper produced performing all the steps of the claimed process using a specific type of cationic polymer are not enhanced, the process is not claimed. *See In re Angstadt*, 537 F.2d 498, 504 (CCPA 1976)("Without undue experimentation or effort or expense the combinations which do not work will readily be discovered and . . . the claims do not cover them.")

Applicant's Specification teaches (Spec., p. 2, l. 36; p. 4, l. 11) "fixing the cationic polymer and filler particles to the fibers of the pulp" and "the cationic polymer fixes the titanium dioxide and/or calcium carbonate filler particles to the fibers of the pulp" (Claims 4 and 9). If, as Kuo teaches, its charged "microparticles [must] interact with either the cationic polymers of the invention or the anionic components which are present in the aqueous pulp suspension" (Kuo, col. 6, ll. 1-5), then the cationic polymers should not be available to interact with calcium carbonate and/or titanium dioxide filler particles and fix the filler particles to the fibers of the pulp. Thus, it should be readily apparent that depositing Kuo's pulp slurry containing pulp fibre, a cationic polymer containing vinylamine units, charged

microparticles, and either calcium carbonate or titanium dioxide on a substrate and dewatering does NOT fix the filler particles to the fibers of the pulp as Applicant's currently amended Claims 4 and 9 require and the supporting Specification instructs.

Kuo's examples do not show that the ash content and opacity of any filler-containing paper Kuo produced was ever enhanced by adding a cationic polymer to the pulp slurry in amounts of 0.04% or less by weight based on the dry weight of the pulp relative to the ash content and opacity of the filler-containing paper produced with no cationic polymer added to the pulp slurry. Accordingly, Kuo's disclosure does not anticipate all the elements to the methods Applicant claims and reasonable would not have made them obvious to a person having ordinary skill in the art in view of the evidence of record as a whole.

Finally, new claims 10 and 11 require titanium dioxide as the particulate filler. Kuo clearly does not anticipate or render obvious Applicant's claimed methods using titanium dioxide as the particulate filler. Moreover, the base paper of Claim 8 is limited to papers known to require both an unusually high ash content and opacity. Nothing in the prior art suggests that Kuo's process without the synergistic benefit of the added charged microparticles would have been useful for producing papers known to require both an unusually high ash content and opacity.

Rejection of Claim 8 under 35 U.S.C. § 103 over Kuo in view of Takahata, Snow & Koichi

Previously presented Claim 8 is rejected under 35 U.S.C. § 103 for obviousness over Kuo view of the combined teachings of Takahata (U.S. Patent 3,933,558, issued January 20, 1976), Snow (U.S. Patent 5,830,318, issued November 3, 1998), and Koichi (JP 09-217292, published August 19, 1997)(OA, p.6). The rejection fairly should be withdrawn.

While Takahata, Snow, and Koichi do appear to disclose base papers having a high opacity and ash content in the form of a construction material, India paper, or tip base paper for cigarettes, there is not evidence that Kuo discloses a method for making and using such

papers without employing charged microparicles. Moreover, Kuo does not reasonably suggest that the comparatively inferior process without charged microparticles is capable of producing such unusually high opacity and high ash content paper forms.

Rejection of claims under 35 U.S.C. § 103 over Utecht, Carr, Lai, Takahata, Snow & Koichi

Previously presented Claims 4-9 are rejected under 35 U.S.C. § 103 over Utecht (U.S. Patent 6,184,310, issued February 6, 2001) in view of Carr (US 2004/0250972 A1, published December 16, 2004), Takahata, Snow, and Koichi, as evidenced by Lai (EP 0331047, published September 6, 1989). In light of the current amendments to Claims 1 and 9, the rejections should be withdrawn.

Utecht discloses "carbamate-functionalized polymers . . . as retention, drainage and flocculation aids and . . . fixatives in papermaking (Utrecht, col. 6, ll. 56-58). Most significantly, Utecht immediately thereafter states (Utecht, col. 6, ll. 58-59; emphasis added), "They are used in the customary amounts for this purpose."

Nevertheless, the Examiner finds (OA, p. 7, 3rd full ¶):

> The polymers are used as retention and drainage aids and as fixatives for making all known paper, paperboard and cardboard grades by adding them to the stock from 0.01% to 0.1% by weight of the dry fiber. Many of the claimed pulps are disclosed. Suitable fillers used in making papers include chalk (calcium carbonate) and titanium dioxide (col 6, line 56 to col 7, line 7; col 7, lines 14-18).

The Examiner relies upon Carr for its disclosure of a typical papermaking process (OA, pp. 7-8, bridging ¶). Takahata, Snow, and Koichi are relied upon to show that the high opacity, high ash content paper forms made by Applicant's claimed process which are specified in Applicant's Claim 8 are well-known in the art. The Examiner relies on Lai's disclosure at page 5, lines 24-39, merely to show that acid hydrolyzed copolymers made from monomers including N-vinylformamide are cationic polymers (OA, p. 7, 2nd full ¶, last sentence).

First, Lai teaches that "the customary amounts" of hydrolyzed polymers prepared from N-vinylformamide monomers which are useful as retention aids for fillers such as

titanium dioxide in papermaking methods are from "0.05 to 0.5 wt%, preferably 0.1 to 0.2 wt%, . . . based on fiber" (Lai, p. 5, ll. 50-56; p. 9, Claims 1-15; and p. 8, Example 12, ll. 49-50). Read as a whole, Utecht's disclosure is consistent with Lai's teaching.

While Utecht generally teaches that its "polymers are used as retention and drainage aids and as fixatives for making all known paper, paperboard and cardboard grades by adding them to the stock from 0.01% to 0.1% by weight of the dry fiber" and mentions the use of the same polymers for preparing pulp slurries used for preparing filled papers wherein "[s]uitable fillers used in making papers include chalk (calcium carbonate) and titanium dioxide" (OA, p. 7, 3rd full ¶), the disclosed fixing effects of Utecht's polymers, and the amounts of Utecht's polymers useful as fixatives, are directed to fixing "contraries" in papermaking processes for making paper stocks containing large quantities of "contraries" and are not directed to fixing fillers such as titanium dioxide and chalk in papers containing large quantities of such fillers. While the Examiner's finding that Utecht's polymers generally are useful as fixatives in amounts from 0.01% to 0.1% by weight of the dry fiber is generally correct, Utecht's polymers are said to be useful as fixatives for "contraries" in amounts from 0.01% to 0.1% by weight of the dry fiber.

Regarding Utecht's carbamate-functional polymers, Utecht teaches that "[t]hey are used in the customary amounts" when used as retention, drainage and flocculation aids and also as fixatives in papermaking (Utecht, col. 6, ll. 56-59). However, Utecht expressly states (Utecht, col. 6, ll. 59-65; emphasis added):

> They are especially useful as processing aides in the dewatering of paper stocks which contain contraries. Contraries are, for example, ligninsulfonates or other ingredients of wood and humic acids. The carbamate-functionalized polymers to be used according to the invention can be used for making all known paper, paperboard and cardboard grades.

Accordingly, while Utecht generally instructs that the retention, drainage and flocculation aids are preferably used in papermaking in amounts from 0.01 to 0.1% by weight, based on

the dry fiber materials (Utecht, col. 7, ll. 2-4), Utecht specifically states (Utecht, col. 7, ll. 4-13):

> The carbamate-functionalized polymers additionally have a good fixing effect in such paper stocks as contain relatively large quantities of contraries; waste paper stocks, for example, contain contrary quantities of resins, polymeric binders and other contrary solids. To fix the contraries on the fibers or in the paper, the carbamate-functionalized polymers . . . are used for example in amounts from 0.001 to 0.1% by weight, based on dry paper stock.

Utecht does not teach or reasonably suggest that its polymers have any ability to fix particulate fillers, especially fillers such as calcium carbonate or titanium dioxide filler particles, on fibers or in paper in amounts from 0.001 to 0.1% by weight, based on dry paper stock. To the contrary, with regard to filler slurries and filled papers, Utecht teaches (Utecht, col. 7, ll. 14-20; emphasis added):

> The carbamate-functionalized polymers are also useful as emulsifiers for preparing aqueous filler slurries which are used for example in the preparation of filled papers. Examples of suitable fillers are clay, chalk, titanium dioxide and kaolin. The quantities of emulsifier to prepare filler slurries range for example from 0.1 to 2, preferably 0.5 to 1.5% by weight, based on the aqueous slurry.

Persons having ordinary skill in the art reasonably would have understood from Utecht's complete disclosure that:

(1) Utecht's carbamate-functionalized polymers are useful for fixing "contraries" to pulp fibers in amounts from 0.001-0.1% by weight based on dry paper stock;

(2) Utecht's "contraries" are not particulate fillers such as titanium dioxide and chalk;

(3) Utecht does not teach that carbamate-functionalized polymers are useful for fixing particulate fillers to pulp fibers in amounts from 0.001-0.1% by weight based on dry paper stock;

(4) Utrecht teaches that carbamate-functionalized polymers are useful "in the customary amounts" as retention, drainage and flocculation aids and also as fixatives in papermaking;

(5) Utrecht teaches that carbamate-functionalized polymers generally are useful as "retention, drainage, and flocculation aids . . . in papermaking in amounts from 0.01 to 0.1% by weight, based on the dry fiber materials"; and

(6) Utrecht teaches that carbamate-functionalized polymers are useful as emulsifiers for preparing aqueous filler slurries in amounts from 0.1 to 2, preferably 0.5 to 1,5% by weight, based on the aqueous slurry.

Lai's teaching to use cationic polymers as retention aids for titanium dioxide in amounts ranging from 0.05 to 0.5 wt%, preferably 0.1 to 0.2 wt%, is entirely consistent with Utecht's disclosure relating to the amounts of its polymers effective for use in aqueous filler slurries.

To the contrary, the methods Applicant describes and claims (Claims 4 and 9) requires:

(1) fixing particulate fillers of titanium dioxide and.or calcium carbonate to pulp fibers using cationic polymer containing N-vinylformamide units in amounts from 0.0005-0.04%, preferably from 0.001-0.04%, by weight based on dry paper stock;

(2) a mass ratio of cationic polymer to particulate filler ranging from 0.001/100 to 0.5/100 by conversion to solids concentration; and

(3) an enhanced ash content and opacity of the filler-containing paper produced relative to the ash content and opacity of the filler-containing paper produced without including the cationic polymer in the pulp slurry.

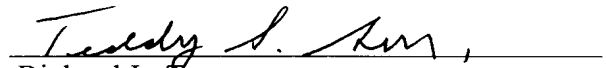
The combined teachings the Examiner relies upon to establish the obviousness of Applicant's currently claimed methods are markedly deficient. The applied prior art reasonably would not have led persons having ordinary skill in the art to understand that increased amounts of titanium dioxide filler and/or chalk could be fixed to pulp fiber using 0.04% or less of the cationic polymers identified in Applicant's claims with any reasonable

expectation of successfully enhancing the opacity and ash content of the resultant paper as is required for a conclusion of obviousness in this case. *In re O'Farrell*, 853 F.2d 894, 903 (Fed. Cir. 1988). Accordingly, the Examiner's outstanding rejections should be withdrawn.

For the reasons stated herein, Applicant's current claims are patentable over the applied prior art and otherwise in condition for allowance. Accordingly, early Notice of Allowance is earnestly requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, L.L.P.



Richard L. Treanor
Attorney of Record
Registration No. 36,379

Teddy S. Gron
Registration No. 63,062

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 07/09)